



Extron® Electronics

INTERFACING, SWITCHING AND CONTROL

User's Manual



TP T Series Transmitters

TP T 15 HD A

TP T 15 HD AV

TP T BNC DA4

Audio/Video Twisted Pair Cable Transmitters

Precautions

Safety Instructions • English

-  This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.
-  This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

- Read Instructions** • Read and understand all safety and operating instructions before using the equipment.
- Retain Instructions** • The safety instructions should be kept for future reference.
- Follow Warnings** • Follow all warnings and instructions marked on the equipment or in the user information.
- Avoid Attachments** • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français

-  Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).
-  Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

- Lire les instructions** • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.
- Conserver les instructions** • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.
- Respecter les avertissements** • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.
- Eviter les pièces de fixation** • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch

-  Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.
-  Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

- Lesen der Anleitungen** • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.
- Aufbewahren der Anleitungen** • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.
- Befolgen der Warnhinweise** • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.
- Keine Zusatzgeräte** • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen könnten.

Instrucciones de seguridad • Español

-  Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.
-  Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

- Leer las instrucciones** • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.
- Conservar las instrucciones** • Conservar las instrucciones de seguridad para futura consulta.
- Obedecer las advertencias** • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.
- Evitar el uso de accesorios** • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

安全须知 • 中文

-  这个符号提示用户该设备用户手册中有重要的操作和维护说明。
-  这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

- 阅读说明书** • 用户使用该设备前必须阅读并理解所有安全和使用说明。
- 保存说明书** • 用户应保存安全说明书以备将来使用。
- 遵守警告** • 用户应遵守产品和用户指南上的所有安全和操作说明。
- 避免追加** • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluss, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegenstellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, diesen Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitz und Öffnungen • Wenn das Gerät Schlitz oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Lithium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearía ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cable de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Descharar las baterías usadas siguiendo las instrucciones del fabricante.

警告

电源 • 该设备只能使用产品上标明的电源。设备必须使用有地线的供电系统供电。第三条线（地线）是安全设施，不能不用或跳过。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

电源线保护 • 妥善布线，避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE *This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.*

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TP T Series Transmitters

1

Chapter One

Introduction

About this Manual

About the TP T Series Transmitters

Features

Introduction

About this Manual

This manual describes the procedures for installing and using the Extron TP Series transmitters, including the TP T 15HD A, TP T 15HD AV, and TP T BNC DA4. The terms "TP T transmitter" and "transmitter" are used interchangeably throughout this manual to refer to these three products generically.

About the TP T Series Transmitters

The Extron Twisted Pair (TP) series transmitters provide long-distance distribution of RGB video, component video, S-video, composite video, and stereo audio over Extron's Enhanced Skew-Free™ A/V UTP cable (recommended) or standard Category (CAT) 5/5e/6 unshielded twisted pair (UTP), shielded twisted pair (STP), or foil shielded twisted pair (FTP) cable.

NOTE *The TP T Series transmitters are designed for and perform best with Extron Enhanced Skew-Free cable.*

Recommended transmission distances

The minimum reliable transmission distance to all receivers, with the exception of the TP R 15HD A, is 25 feet (7.6 m). There is no minimum distance for transmission to the TP R 15HD A.

The maximum distance is determined by the output frequency and resolution. The following tables specify the recommended maximum transmission distances from a TP T transmitter to an Extron TP R series receiver, using Extron Skew-Free A/V UTP cable or UTP CAT 5 cable terminated with CAT 5e or CAT 6 rated connectors.

NOTE *Extron recommends using the highest quality cable available and affordable. Use of pre-terminated and tested cables is also recommended. Cables terminated on site should be tested before use to ensure that they comply with Category 5e specifications.*

TP T Series transmitter to TP R 15HD A receiver using CAT 5/5e/6 or Enhanced Skew-Free cable at 60 Hz

Video format	Maximum distance, high quality	Maximum distance, variable quality
Component video	700' (213 m)	800' (245 m)
Composite video	700' (213 m)	800' (245 m)
S-video	700' (213 m)	800' (245 m)
640 x 480	500' (150 m)	550' (165 m)
800 x 600	400' (120 m)	450' (135 m)
1024 x 768	300' (90 m)	400' (120 m)
1280 x 960	300' (90 m)	350' (105 m)
1280 x 1024	250' (75 m)	300' (90 m)
1360 x 765	250' (75 m)	300' (90 m)
1365 x 768	250' (75 m)	300' (90 m)
1366 x 768	250' (75 m)	300' (90 m)
1440 x 900	250' (75 m)	300' (90 m)
1400 x 1050	250' (75 m)	300' (90 m)
1600 x 1200	200' (60 m)	250' (75 m)
1920 x 1200	200' (60 m)	250' (75 m)

**TP T Series transmitter to TP R BNC A and TP R BNC A AV receivers
using CAT 5/5e/6 or Enhanced Skew-Free cable at 60 Hz**

Video format	Maximum distance, high quality	Maximum distance, variable quality
Component video	1000' (300 m)	1050' (320 m)
Composite video	1000' (300 m)	1050' (320 m)
S-video	1000' (300 m)	1050' (320 m)
640 x 480	1000' (300 m)	1050' (320 m)
800 x 600	800' (245 m)	900' (275 m)
1024 x 768	600' (185 m)	700' (215 m)
1280 x 960	450' (135 m)	600' (185 m)
1280 x 1024	400' (120 m)	500' (150 m)
1360 x 765	400' (120 m)	500' (150 m)
1365 x 768	400' (120 m)	500' (150 m)
1366 x 768	400' (120 m)	500' (150 m)
1440 x 900	350' (105 m)	450' (135 m)
1400 x 1050	350' (105 m)	450' (135 m)
1600 x 1200	300' (90 m)	400' (120 m)
1920 x 1200	300' (90 m)	400' (120 m)

NOTE It is possible to exceed the recommended distances; however, image quality may be degraded.

Each transmitted TP signal must be connected to the appropriate Extron TP receiver. This user's manual documents the installation, features, and operation of the TP transmitters only. For information about the TP receivers, refer to the *TP Receivers Family User's Manual*.

Features

All TP T Series transmitters

Frequency range — Support 15 kHz to 130 kHz horizontal frequency.

Transmission distance — Transmit signals up to 1,000 feet (300 m) or more over CAT 5, 5e, or 6 cable.

Mounting — Can be rack mounted with an Extron twisted pair rack mounting kit and a 1U, 9.5" or 6" deep rack shelf kit. They can also be furniture mounted with an under-desk or through-desk mounting kit.

TP T 15HD A transmitter

Video input — Accepts computer analog video on a female 15-pin HD connector.

With an adapter cable, it can accept Macintosh, 13W3 video, RGBHV, RGBS, RGsB, component video, S-video, or single source composite video input.

NOTE Only bi-level sync is supported with component video.

Buffered local monitor output — Allows you to view the displayed image on a local monitor that is located up to 100 feet (30 m) from the transmitter, without signal reflections or crosstalk.

Audio input — Accepts audio on a 3.5 mm stereo mini jack.

Introduction, cont'd

Output — An RJ-45 connector provides a connection to an Extron TP R receiver.

Horizontal shift — Allows you to adjust the horizontal placement of the computer video image on the screen. This is also called "horizontal centering".

DDSP™ (Digital Display Sync Processing™) — Allows the sync signal to pass through without altering sync pulse timing or width.

TP T 15HD AV transmitter

Video inputs —

Computer video — Accepts computer analog video on a female 15-pin HD connector. With an adapter cable, the transmitter can accept a Macintosh video, 13W3 video, or RGBHV, RGBS, RGsB, component video, S-video, or single source composite video input.

NOTE *Only bi-level sync is supported with component video.*

Composite video — Accepts NTSC, PAL, and SECAM composite video on an RCA jack.

Audio input — Accepts PC audio on a 3.5 mm stereo mini jack, and stereo audio on two RCA jacks.

Outputs — Two RJ-45 connectors provide connections to a TP RGB video receiver and a TP composite video receiver:

Buffered local monitor output — Allows you to view the displayed computer video image on a local monitor that is located up to 100 feet from the transmitter, without signal reflections or crosstalk.

Horizontal shift — Allows you to adjust the horizontal placement of the computer video image on the screen. This is also called "horizontal centering".

DDSP™ (Digital Display Sync Processing™) — Allows the sync signal to pass through without altering sync pulse timing or width.

TP T BNC DA4 transmitter/distribution amplifier

Video input — Accepts RGBHV, RGBS, RGsB, component, and composite video on BNC connectors. With an adapter cable, the transmitter can also accept an S-video input.

NOTE *Only bi-level sync is supported with component video.*

Outputs — Four individually isolated, buffered, and amplified outputs on RJ-45 connectors allow connection to up to four Extron TP receivers.

Compatibility between products

The TP T 15HD AV is backward compatible with the TP T 15HD A and the TP T BNC DA4. However, the TP T 15HD A and the TP T BNC DA4 (products whose part numbers end in -02) are not forward compatible with the TP T 15HD AV (whose part number ends in -03).



TP T Series Transmitters

2

Chapter Two

Installation

Installation

Connections and Cabling on the Front and Rear Panels

Controls and Indicators on the Front and Rear Panels

Troubleshooting

Installation and Operation

Installation

CAUTION *Installation and service must be performed by authorized personnel only.*

Overview

To install and set up a TP transmitter for operation, follow these steps:

- 1** Disconnect power from all of the equipment, including the video source(s) (such as computers or DVD players), the transmitter, the receiver(s), and the output display(s).
- 2** If using component, S-video, or composite video, reconfigure the video jumpers as needed. See “[Configuring video jumpers for component video, S-video, and composite video](#)”, on the next page.
- 3** (TP T 15HD AV only) If desired, configure the audio jumpers to make the transmitter compatible with unmodified TP receivers. See “[Setting audio jumpers for use with unmodified receivers](#)”, later in this chapter.

NOTE *The TP T 15HD AV is a redesigned (modified) transmitter. The audio jumpers configure the audio portion of the composite video TP link to work with the similarly redesigned TP R BNC AV receiver or with older, unmodified receivers. Redesigned transmitters and receivers have an identifying label.*

- 4** Mount the transmitter in a rack, under a desk or podium, or through a desk or table as desired. See “[Mounting the transmitters](#)”, later in this chapter.
- 5** Connect the input cables. See “[Connectors and Cabling on the Front and Rear Panels](#)”, later in this chapter.
- 6** Connect the output cable(s) from the transmitter to the TP receiver(s). See “[Connectors and Cabling on the Front and Rear Panels](#)”, later in this chapter, and refer to the *TP Receivers Family User’s Manual* for more information.
- 7** Configure the TP receiver(s). Refer to the *TP Receivers Family User’s Manual*.
- 8** Plug the included external 15 VDC power supply into the transmitter’s three-pole captive screw connector, and power on the video source(s) and the output display(s).

NOTE *The transmitters can also receive power from the associated Extron TP receiver(s) (except from the TP R 15HD A) via the TP cable. Extron recommends using the local power supply; however, this may not be necessary for some applications.*

- *The transmitters may not require a local power supply for cable lengths of 300’ (91 m) or less.*
- *Any transmitter connected to a TP R 15HD A receiver always requires the local power supply.*

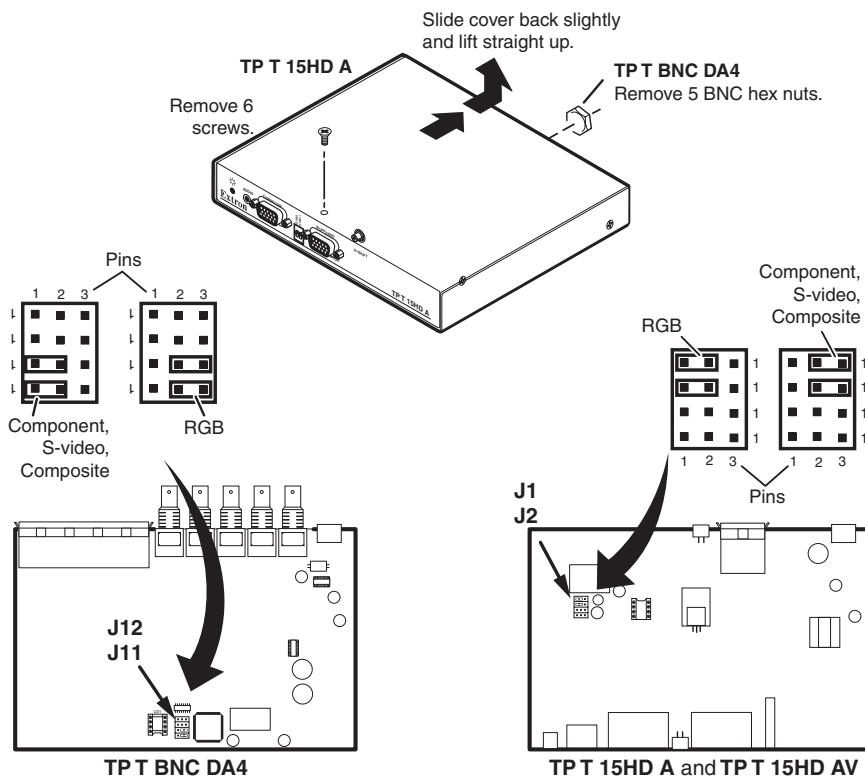
If you encounter problems, use the local power supply.

- 9** **TP T 15HD A and TP T 15HD AV:** Set the ID Pin 4 and ID Pin 11 DIP switches on the front panel and the DDSP™ DIP switch on the back panel as desired. (See the [DIP switch descriptions](#) under “[Connectors and Cabling on the Front and Rear Panels](#)”, later in this chapter.)
- 10** **TP T 15HD A and TP T 15HD AV:** Adjust the horizontal shift control on the front panel of the transmitter and receiver(s). See “[Controls and Indicators on the Front and Rear Panels](#)”, later in this chapter, and refer to the *TP Receivers Family User’s Manual*.

Configuring video jumpers for component, S-video, and composite video

The TP T Series transmitters are configured at the factory for RGB video. To transmit component video (bi-level sync only), S-video, or composite video, you must place the video jumpers on the transmitter's internal main board as follows:

1. Remove the two screws on each side of the unit and one screw on top.
2. **TP T BNC DA4 only:** Using an Extron BNC extraction tool (part #100-096-01) or a 14 mm deep well socket wrench with thin walls, remove the five hex nuts securing the BNC connectors to the rear panel. (See the illustration below.) Slide the cover forward until the cover clears the BNC connectors.
3. Slide the cover back until it clears the rear panel connectors, then lift it off.



Configuring video jumpers

4. Locate the appropriate jumpers on the circuit board:
For TP T 15HD A and TP T 15HD AV: J1 and J2
For TP T BNC DA4: J11 and J12
5. Place the jumpers on the pins as follows:
 - For RGB video, place the jumper so that it connects pin 2 to pin 3 at both jumper locations.
 - For any other video format, place the jumper so that it connects pin 1 to pin 2 at both jumper locations.
6. Replace the cover and reinstall the screws.

Installation and Operation, cont'd

Setting audio jumpers for use with unmodified receivers

NOTE Older (unmodified) transmitters and receivers are fully compatible with each other, but not with the TPX 88 A twisted pair matrix switcher.

Redesigned (modified) transmitters and receivers are fully compatible with each other and with the TPX 88 A.

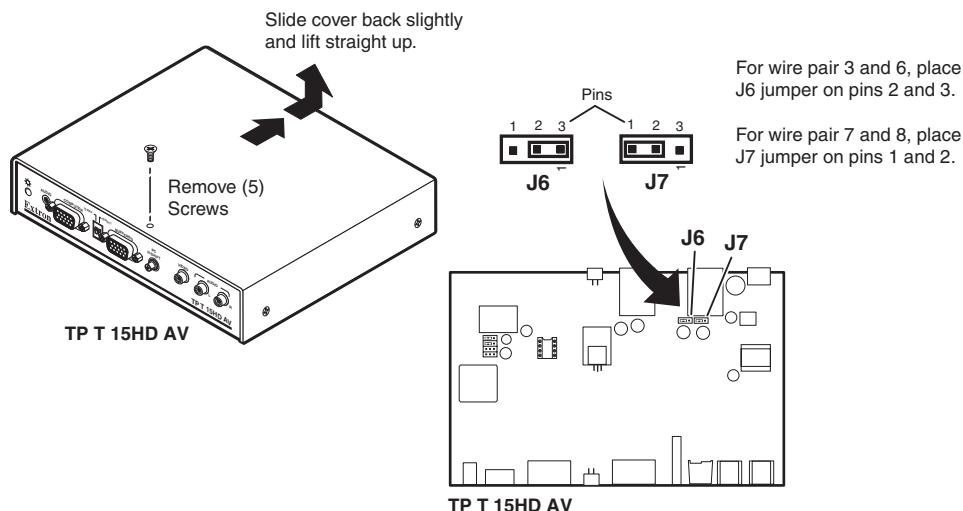
You can use jumper connections to make redesigned transmitters and receivers compatible with the unmodified models, but not with the TPX 88 A.

NOTE Redesigned (modified) transmitters and receivers have an identifying label.

The audio that is associated with the composite video link of TP T 15HD AV transmitters is transmitted on wire pair 3 and 6. This configuration is compatible with redesigned TP receivers and the TPX 88 A.

If you intend to match a TP T 15HD AV transmitter with an older, unmodified TP receiver, and you do not plan to include a TPX 88 A in your system, you can set the transmitter to send the audio on wire pair 7 and 8, making it compatible with an older TP receiver, by shifting internal jumpers as follows:

1. Remove the two screws on each side and the screw on top of the cover.



Configuring audio jumpers

2. Slide the cover back until it clears the rear panel connectors, then lift it off.
3. Locate jumpers J6 and J7 on the printed circuit board.
4. Place the jumpers on the following pins as appropriate:
 - For compatibility with redesigned (modified) receivers and the TPX 88 A, place the jumpers so that they connect pin 1 to pin 2 at both jumper locations.
 - For compatibility with older (unmodified) receivers, place the jumper so that they connect pin 2 to pin 3 at both jumper locations.
5. Replace the cover and reinstall the screws.

Mounting the transmitters

The TP T Series transmitters can be set on a table; mounted on a rack shelf; or mounted through or under a desk, podium, or tabletop. The following optional mounting kits are available:

- **RSM 100** — Rack shelf mount kit for twisted pair products (#70-123-01)
- **RSB 129** — 1U, 9.5" deep basic rack shelf (#60-604-01, -02)
- **RSU 129** — 1U, 9.5" deep rack shelf kit (#60-190-01, -02)
- **MBU 125** — Under-desk mount kit (#70-077-01)
- **MBD 129** — Through-desk mount kit (#70-077-02)

Tabletop use

Four self-adhesive rubber feet are included with the unit. For tabletop use, affix one foot at each corner of the bottom of the transmitter and place the unit in the desired location.

Rack mounting

UL rack mounting guidelines

The following Underwriters Laboratories (UL) guidelines pertain to the safe installation of the equipment in a rack.

1. **Elevated operating ambient temperature** — If the equipment is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with the maximum ambient temperature ($T_{ma} = +113^{\circ}\text{F}, +45^{\circ}\text{C}$) specified by Extron.
2. **Reduced air flow** — Install the equipment in a rack so that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading** — When mounting the equipment in the rack, ensure that uneven mechanical loading does not create a hazardous condition.
4. **Circuit overloading** — Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Also consider equipment nameplate ratings when addressing this concern.
5. **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (for example, use of power strips).

Rack mounting procedure

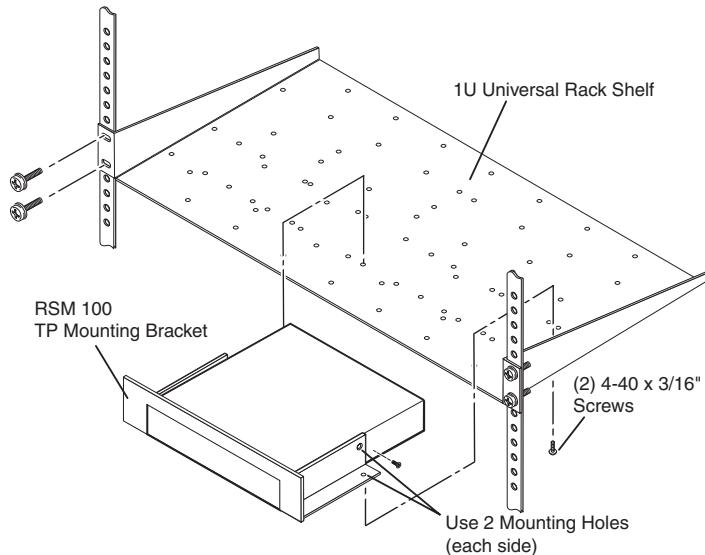
To mount the transmitter on a 9.5 inches deep rack shelf,

1. If rubber feet are attached to the bottom of the unit, remove them.
2. Fit the RSM 100 mounting bracket around the transmitter and attach it to the unit using one mounting hole on each end.
3. Mount the bracket containing the unit onto the rack shelf, using two 4-40 x 3/16 inch screws in the two mounting holes in the bottom of the bracket to secure it.
4. Install blank panel(s) or other unit(s) on the rack shelf as desired.
5. Attach the rack shelf to the rack using the supplied bolts.

See the [illustration](#) on the next page.

Installation and Operation, cont'd

The following illustration shows how to mount the transmitter on a 9.5" rack shelf.



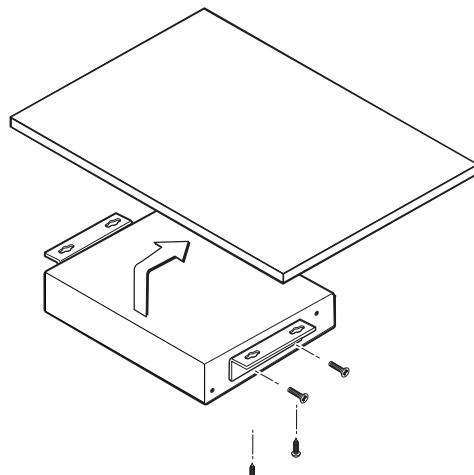
Rack mounting the transmitter

Under-desk mounting

Furniture-mount the transmitter under a desk or shelf using the optional mounting kit (part #70-077-01), as illustrated below.

To mount the transmitter under a desk, podium, or table top,

1. If rubber feet are attached to the bottom of the unit, remove them.
2. Remove the two screws from one side of the unit. Retain the screws for possible later reassembly.
3. Attach one bracket to the side of the unit, using the provided machine screws.
4. Repeat steps 2 and 3 on the other side of the unit.
5. Hold the unit with the attached brackets against the underside of the table or other furniture. On the mounting surface, mark the location of the bracket's screw holes.



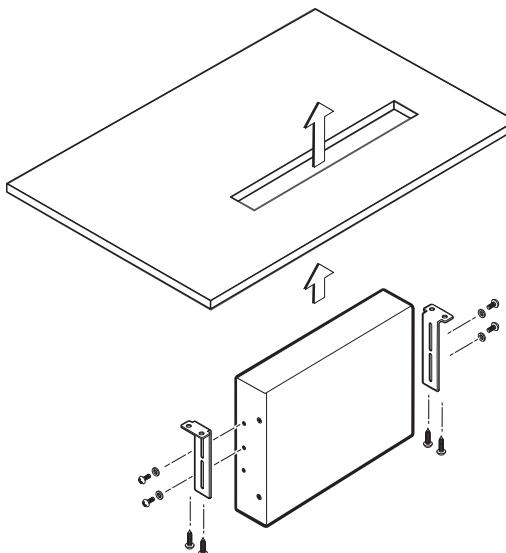
Under-desk mounting the transmitter

-
6. Drill pilot holes $1/4$ inch (6.4 mm) deep and $3/32$ inch (2 mm) in diameter into the table or desk top at the marked screw locations. The holes should be drilled from the underside or inside (concealed side) of the furniture where the transmitter will be located.
 7. Insert #8 wood screws into the four pilot holes. Tighten each screw into the mounting surface until slightly less than $1/4$ inch of the screw head protrudes.
 8. Align the mounting screws with the slots in the brackets and place the unit against the surface, with the screws through the bracket slots.
 9. Slide the unit slightly forward or back, then tighten all four screws to secure it.

Through-desk mounting

Mount the transmitter through a desk or table, using the optional through-desk mounting kit (part #70-077-02).

1. If rubber feet are attached to the bottom of the unit, remove them.
2. Loosely attach the mounting brackets to the transmitter using the four machine screws and washers supplied with the mounting kit.
3. Hold the transmitter against the inside of the surface through which it will be mounted. On the inside of the mounting surface, mark the four screw holes and the material to be removed (approximately 1.2 inches by 6.9 inches [3.0 cm by 17.5 cm]).
4. Cut out the table material. Test the fit by inserting the front of the transmitter through the hole. If necessary, use a rasp or coarse file to enlarge the hole.
5. Drill pilot holes each $1/4$ inch (6.4 mm) deep and $3/32$ inch (2 mm) in diameter in the desk or table where you marked the screw locations in step 2. The holes should be drilled from the underside or inside (concealed side) of the furniture where the transmitter will be located.
6. Using the four provided wood screws, secure the brackets to the mounting surface.



Through-desk mounting the transmitter

Installation and Operation, cont'd

7. Slide the unit up and down or back and forth in the mounting brackets until the front panel of the unit is at the desired height. Tighten the screws that secure the brackets in place.

If the bracket screws are inaccessible to a screwdriver when the unit is in place,

- a. Mark the location of the brackets relative to the screws.
- b. Remove the transmitter from inside the furniture.
- c. Tighten the screws.
- d. Replace the unit inside the surface.

Grounding the transmitter

RGB and computer video transmitters may need to be grounded to ensure that the video and audio signals are not degraded. The TP T 15HD A and TP T 15HD AV may require grounding if all of the following conditions exist:

- The signal source is a laptop computer.
- No local monitor is connected.
- A local power supply is not being used.

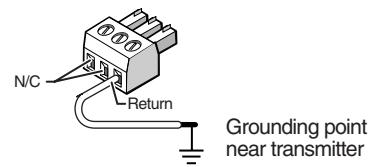
Grounding may also be required if there is no common ground in the power distribution system.

Indications that grounding may be required include:

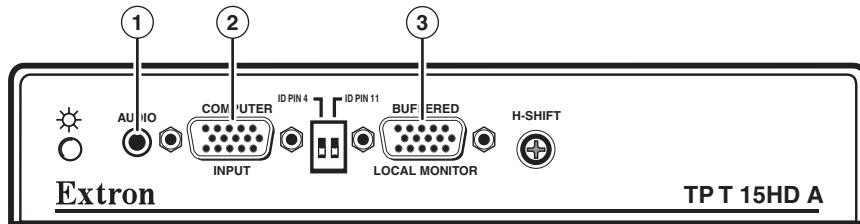
- The receiver's Power LED is lit amber when a connection is made to the transmitter.
- The receiver is in auto mode and its Manual/Auto LED flashes.
- The receiver is in manual mode and an image appears only when the Peaking adjustment is at the minimum level. Additionally, the image may be overpeaked with horizontal streaking to the right of the displayed information.
- No audio, or distorted and noisy audio, is heard.

Ground the transmitter using any of the following methods:

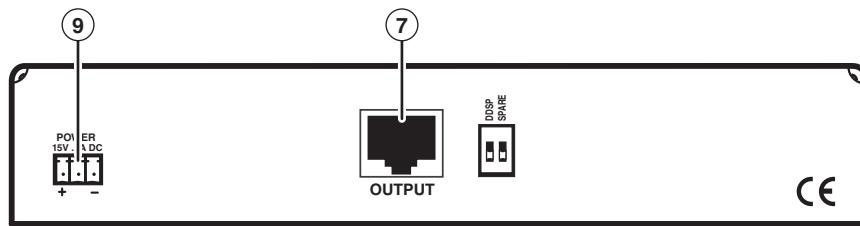
- Connect a local 15 V power supply to the transmitter.
- Use STP rather than UTP cable and connectors.
- Use a 3.5 mm captive screw connector to connect a ground wire between the power return pin and a grounding point near the transmitter, such as a grounded power outlet or an equipment rack. (See the illustration at right.) Use this method if you are not using local power.



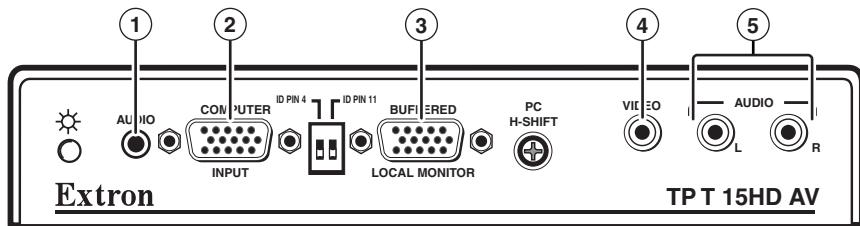
Connectors and Cabling on the Front and Rear Panels



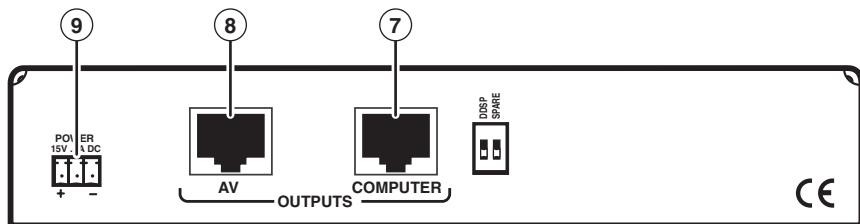
TP T 15HD A front panel



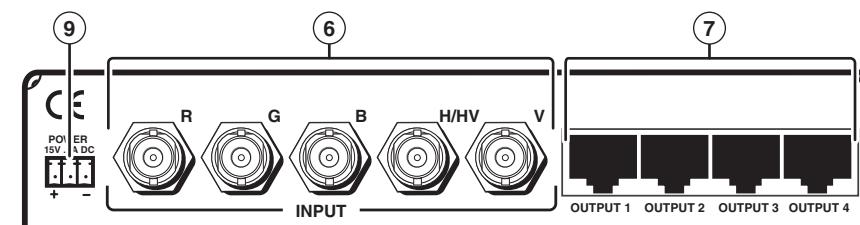
TP T 15HD A rear panel



TP T 15HD AV front panel



TP T 15HD AV rear panel



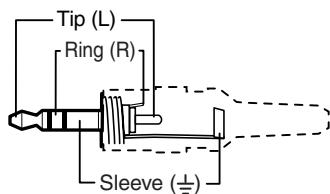
TP T BNC DA4 rear panel

(There are no connectors on the TP T BNC DA4 front panel.)

Installation and Operation, cont'd

- ① **Audio input connector** — Connect PC audio to this 3.5 mm stereo jack. Wire the male plug as shown below.

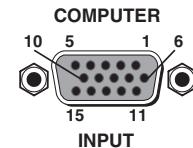
NOTE Only analog line level audio signals should be input on the audio input connector.



Audio input wiring

- ② **Computer Input connector** — Connect a computer video source to this female 15-pin HD connector.

On the TP T 15HD A and the TP T 15HD AV, this connector accepts computer video. It can also accommodate component video, S-video, or composite video if the signal is input on the R, G, and B pins of the 15HD connector using an Extron SYM BNCF/0.5 6-inch (15 cm) cable, part #26-531-01.



Transmission of component video, S-video, or composite video on the computer video input requires that internal jumpers be reconfigured. See “[Configuring video jumpers for component, S-video, and composite video](#),” earlier in this chapter.

NOTE Input only sync signals, no video signals, on the sync pins (pins 13 and 14).

NOTE For component video, use the R (R-Y) and R return pins (pins 1 and 6), G (Y) and G return pins (pins 2 and 7), and B (B-Y) and B return pins (pins 3 and 8).

For S-video, use the R, R return (C-chroma), G, and G return (Y-luma) pins.

For composite video, use the G pin and the associated return pin. For additional genlocked video signals, use the R, B, and associated return pins into the next TP receiver.

NOTE Composite video, S-video, and component video signals input on the female 15-pin HD connector are transmitted out of, or output on, the computer video transmission RJ-45 connector(s) (⑦ in the [rear panel illustrations](#) on the previous page).

- ③ **Buffered Local Monitor output connector** — Connect a local monitor video cable to this female 15-pin HD connector.

- ④ **Video input connector** — Connect composite video to this RCA connector.

- ⑤ **Audio input connector pair** — Connect left and right stereo audio to this pair of RCA connectors.

NOTE Only analog line level audio signals should be input on these connectors.

-
- ⑥ Input BNC connectors** — Connect the desired video input device to these BNC connectors, which accept RGBHV, RGBS, RGsB, component video, S-video, and composite video. Transmission of component video, S-video, or composite video requires that internal jumpers be reconfigured. See “[Configuring video jumpers for component, S-video, and composite video](#)”, earlier in this chapter.

NOTE *Input only sync signals (no video signals) on the H/V and V BNC connectors.*

- **For RGBHV video**, use the R, G, B, H/HV, and V BNC connectors.



- **For RGBS video**, use the R, G, B, and H/HV BNC connectors.



- **For RGsB or component video**, use the R (R-Y), G (Y), and B (B-Y) BNC connectors.



- **For S-video**, use the R (C-chroma) and G (Y-luma) BNC connectors.



- **For composite video**, use the G BNC connector.



For three separate genlocked composite video signals, connect one wire each to the R, G, and B BNC connectors.



- ⑦ Computer video transmission connectors** — Connect a TP cable from any of these female RJ-45 output connectors to an Extron TP receiver.

NOTE *All video signals that are input on the computer input connector, regardless of format, and audio signals that are input on a 3.5 mm jack, are transmitted on these connectors.*

CAUTION *Do not connect this device to a computer data or telecommunications network.*

NOTE *RJ-45 termination must comply with the TIA/EIA T 568A wiring standards for all connections.*

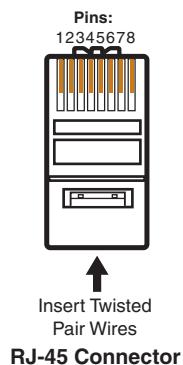
- ⑧ Composite video transmission connector** — Connect a TP cable from this female RJ-45 connector to an Extron TP composite video receiver.

NOTE *Only composite video signals with audio (④ and ⑤ in the [illustration on page 2-9](#)) are transmitted on this connector.*

Installation and Operation, cont'd

Terminating TP cable

The figure below details the recommended termination of TP cables in accordance with the TIA/EIA T 568A wiring standards.



Pin	Wire color	RGB video and audio Signal Level	AV video and audio Signal Level
1	White-green	Red/V. sync + ±0.35 V	Video + +0.35 V
2	Green	Red/V. sync - ±0.35 V	Video - -0.35 V
3	White-orange	Audio and power +15 V with ±0.5 V	Audio +* & power + +15 V
4	Blue	Green + +0.35 V	Reserved None
5	White-blue	Green - -0.35 V	Reserved None
6	Orange	Audio and power ±0.5 V	Audio -* & power - 0 V
7	White-brown	Blue/H. sync + ±0.35 V	Reserved None
8	Brown	Blue/H. sync - ±0.35 V	Reserved None

* Audio can be tied to wire pair 7 and 8 via a jumper. See "Setting audio jumpers for use with unmodified receivers," earlier in this chapter.

TP cable termination

Testing the cables

The TP units are designed for and perform best with Extron Enhanced Skew-Free A/V cable, terminated in accordance with the TIA/EIA T 568 A wiring standard. CAT 5, 5e, and 6 cables are acceptable, but less preferable. Extron also recommends the use of preterminated and tested cables. Cables terminated on site should be tested before use to ensure that they comply with Category 5 specifications.

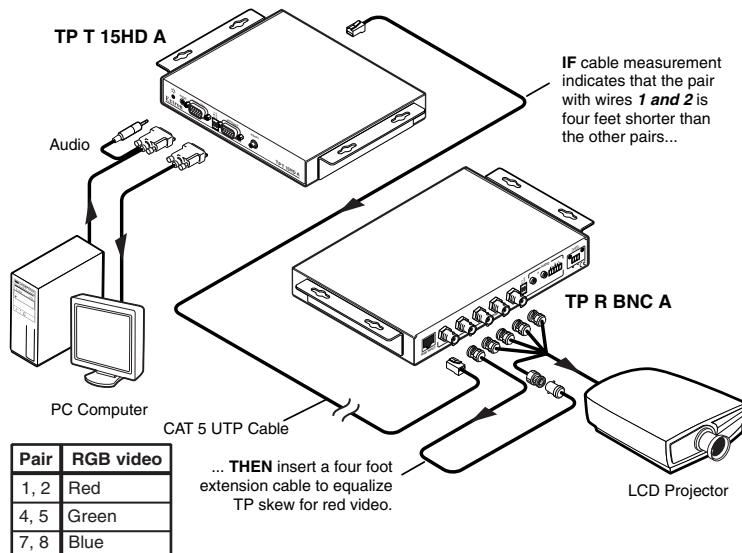
Equalizing pair skew

Using CAT 5, 5e, and 6 cable can lead to registration errors between the red, green, and blue video signals. Pair skew can be measured with test equipment or identified by viewing a crosshatch test pattern with a critical eye to determine if the red, blue, or green video image leads (appears to the left of) the other two video images.

NOTE Unless the cable is changed, the skew adjustment should need to be made only once, during installation.

Use any of the following methods to minimize or eliminate pair skew:

- Switch to an Extron Enhanced Skew-Free A/V UTP cable.
- Add a skew compensation cable equal to the length of the pair skew to the receiver's output.
- Install an SEQ 100 15HD Skew Equalizer on the receiver's video output, and adjust the skew for the leading video image.



Pair skew equalization example

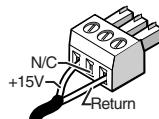
Power connector

⑨ Power connector —

TP T BNC DA4: Plug the external 15 V power supply into this captive screw connector.

NOTE *If the distance between the transmitter and receiver is too great for the receiver to power the transmitter, the video image will be missing, distorted, or noisy, or the receiver's Manual/Auto LED flashes. The transmitter requires a local 15 V power supply.*

TP T 15HD A and TP T 15 HD AV: If desired or for distances over 300 feet (91 m), plug an external 15 VDC power supply into this 3-pole captive screw connector. Wire the connector as shown at right.

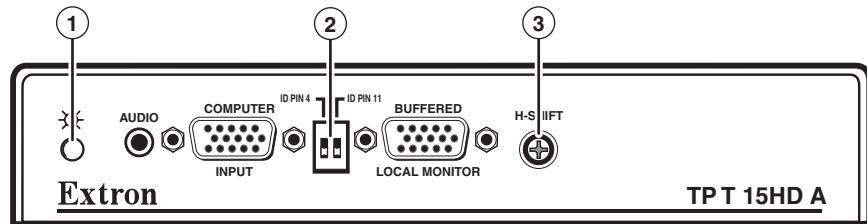


NOTE *If you are using the TP T Series transmitter with a TP R 15HD A receiver, you must use an external power supply to power the transmitter. It cannot be powered via the TP R 15HD A receiver.*

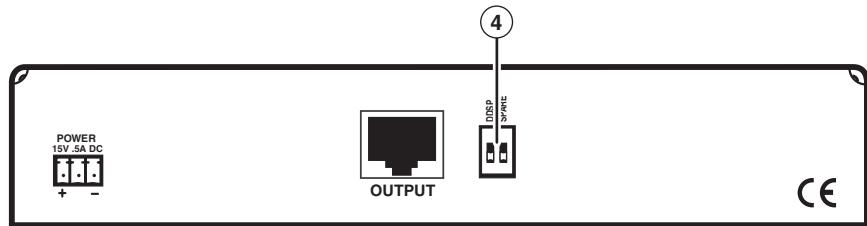
Installation and Operation, cont'd

Controls and Indicators on the Front and Rear Panels

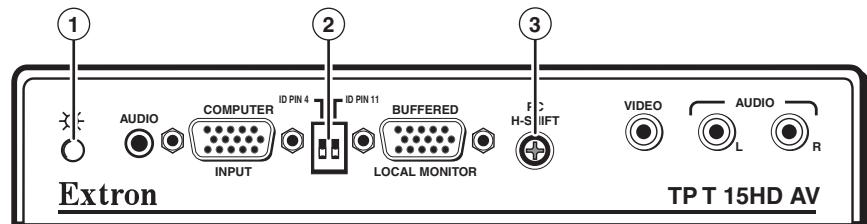
All of the transmitters have front panel Power indicators. In addition, the TP T 15HD A and TP T 15HD AV have horizontal shift control on the front panel and DIP switches on the front and rear panels.



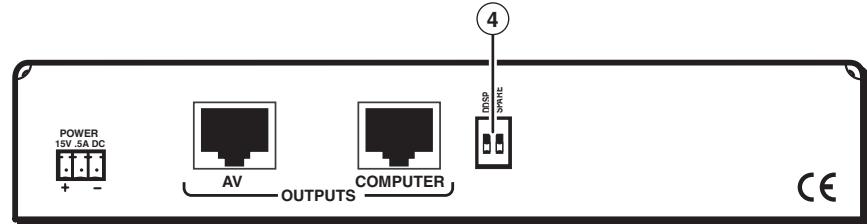
TP T 15HD A front panel



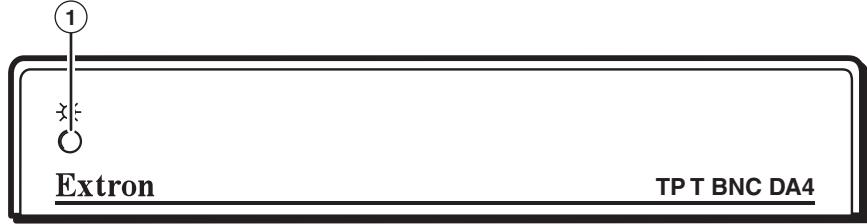
TP T 15HD A rear panel control



TP T 15HD AV front panel controls and indicator



TP T 15HD AV rear panel control



TP T BNC DA4 front panel indicator

① Power/signal LED —

Amber: Indicates that power is applied, but that the transmitter is not connected to a receiver.

Green: Indicates that the transmitter is properly connected to a receiver.

② ID bit switches (TP T 15HD A and TP T 15HD AV) — If a local monitor is installed, set both of these DIP switches to Off. If a local monitor is not installed, set both switches to On.

③ H. Shift (TP T 15HD A) and PC H. Shift (TP T 15HD AV) controls — These front panel controls are 12-turn potentiometers with a soft mechanical stop at the high or low end. When you have reached the high or low end of the adjustment, the potentiometer makes a clicking sound as you turn it, and the display indicates no further changes.

④ DSPP switch — This rear panel DIP switch turns on Digital Display Sync Processing, disabling sync processing for LCD projectors and other displays that cannot handle processed sync.

NOTE *DDSP disables the horizontal shift control.*

Troubleshooting

If the image does not appear

1. Check the transmitter's and receiver's front panel Power LEDs to ensure that all devices are receiving power.
2. Ensure that the transmitter is receiving a video input.
3. Ensure that the TP cable(s) are properly terminated in accordance with TIA/EIA T 568A standards and that the RJ-45 connections are securely made. The Power LEDs on both devices light green when a transmitter is properly connected to a receiver.
4. For computer/RGB video, ensure that the receiver's SOG and C Sync switches are in the correct positions for the video output.
5. For computer video, ensure that the transmitter's ID bit switches are set to On.
6. For computer video on an LCD projector, ensure that the transmitter's DDSP switch is set to On.
7. For component video, ensure that the input signal is bi-level sync and not tri-level.
8. The transmission distance may be too far for remote power. Try connecting the local 15 VDC power supply to the transmitter.
9. The transmission distance may be too short. Ensure that the UTP cable is at least 25 feet (7.6 m) long.
10. If the Manual/Auto switch is in the manual position, ensure that the receiver's level controls are not set too high. Too much level and peaking can cause display problems.
11. For computer video from a laptop or for ungrounded AC distribution systems, the transmitter may need to be grounded. See "[Grounding the transmitter](#)," earlier in this chapter.

Installation and Operation, cont'd

If the image is not displayed correctly

1. For computer video, if the output image looks too green, ensure that the receiver's SOG switch is set to Off.
2. For computer video, if the picture hangs off the edge of the screen, adjust the transmitter's H Shift control.

NOTE *DDSP disables the horizontal shift control.*

3. Place the receiver's Manual/Auto switch to manual and adjust the level and peaking controls for optimum quality.
4. The transmission distance may be too far for remote power. Try connecting the local 15 VDC power supply to the transmitter.
5. For computer video from a laptop or for ungrounded AC distribution systems, the transmitter may need to be grounded. See "[Grounding the transmitter](#)", earlier in this chapter.

If the receiver's Manual/Auto LED flashes

1. The transmission distance may be too far for remote power. Connect the local 15 VDC power supply to the transmitter.
2. Check the RJ-45 connector for a loose connection.

If the actions described above do not solve the problem

Call the Extron S3 Sales and Technical support hotline. (See the rear cover of this manual for the phone number for your region of the world.)



TP T Series Transmitters

A

Appendix A

Specifications, Part Numbers, and Accessories

Specifications

Part Numbers

Specifications, Part Numbers, and Accessories

Specifications

Video — video models

Number/signal type..... 1, 2, or 4 sets of proprietary analog signals

Connectors 1, 2, or 4 female shielded RJ-45

Video input — video models

Number/signal type

- TP T 15HD A 1 analog RGBHV, RGBS, RGsB, component video, S-video, or composite video; or
1 S-video and 1 NTSC/PAL/SECAM composite video from a single source; or
3 NTSC/PAL composite video from a single source
- TP T 15HD AV 1 analog RGBHV, RGBS, RGsB, component video, S-video, or composite video; or
1 S-video and 1 NTSC/PAL/SECAM composite video from a single source; or
3 NTSC/PAL/SECAM composite video from a single source *and*
1 NTSC/PAL/SECAM composite video
- TP T BNC DA4 1 analog RGBHV, RGBS, RGsB, component video, S-video, or composite video; or
1 S-video and 1 NTSC/PAL/SECAM composite video from a single source; or
3 NTSC/PAL/SECAM composite video from a single source

NOTE These products accept component video with bi-level sync only.

Connectors

TP T 15HD A (1) female 15-pin HD (Mac and Sun/SGI to VGA adapters are available.)

TP T 15HD AV (1) female 15-pin HD (Mac and Sun/SGI to VGA adapters are available.)
1 female RCA

TP T BNC DA4 5 female BNC

Nominal level 1 Vp-p for Y of component video and S-video, and for composite video
0.7 Vp-p for RGB and for R-Y and B-Y of component video
0.3 Vp-p for C of S-video

Minimum/maximum levels..... 0.3 V to 1.45 Vp-p with no offset at unity gain

Impedance 75 ohms

Horizontal frequency..... 15 kHz to 130 kHz

Vertical frequency..... 30 Hz to 150 Hz

Return loss..... <-30 dB @ 5 MHz

DC offset (max. allowable)..... 100 mV

Video output — refer to the **TP Receivers Family User's Manual**

Audio — audio models

Number/signal type..... 1 or 2 sets of analog proprietary signals

Connectors 1 or 2 female RJ-45

Frequency response 20 Hz to 20 kHz, ± 0.05 dB

THD + Noise 0.03% @ 1 kHz, 0.3% @ 20 kHz at nominal level

S/N >63 dB at maximum output (unweighted)

Crosstalk..... <-80 dB @ 1 kHz, fully loaded

Stereo channel separation >66.6 dB @ 1 kHz

CMRR..... >33 dB @ 20 Hz to 20 kHz

Audio input — audio models

Number/signal type

TP T 15HD A 1 stereo, unbalanced

TP T 15HD AV 2 stereo, unbalanced

Connectors

TP T 15HD A (1) 3.5 mm mini jack

TP T 15HD AV (1) 3.5 mm mini jack, 2 female RCA

Impedance 5k ohms, unbalanced, DC coupled

Nominal level -10 dBV (316 mV)

Maximum level +5.5 dBu, (unbalanced) at 1%THD+N

CMRR >75 dB @ 20 Hz to 20 kHz

NOTE 0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu

Audio output — refer to the *TP Receivers Family User's Manual*

General

Recommended cable type Enhanced Skew-Free™ A/V UTP Cable or CAT 5/5e/6 (shielded or unshielded)

Power

TP T 15HD A, TP T 15HD AV

15 VDC, 0.8 A, external or provided by the TP R receiver for up to 300' (91.4 m)

TP T BNC DA4 15 VDC, 0.8 A, external

NOTE Twisted pair transmitters cannot receive power from a TP R 15HD A receiver.

Temperature/humidity Storage -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing
Operating +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing

Cooling Convection, no vents

Mounting

Rack mount Yes, with the optional TP rack shelf mounting kit and an optional standard rack shelf kit

Furniture mount Yes, with an optional under-desk or through-desk mounting kit

Enclosure type Metal

Enclosure dimensions 1.3" H x 6.8" W x 4.5" D (<1U high, <half rack width)
(3.3 cm H x 17.3 cm W x 11.4 cm D)
(Depth excludes connectors.)

Product weight

TP T 15HD A, TP T 15HD AV

0.8 lbs (0.4 kg)

TP T BNC DA4 0.9 lbs (0.4 kg)

Shipping weight 3 lbs (2 kg)

Vibration ISTA 1A in carton (International Safe Transit Association)

Regulatory compliance

Safety CE, c-UL, UL

EMI/EMC CE, C-tick, FCC Class A, ICES, VCCI

MTBF 30,000 hours

Warranty 3 years parts and labor

NOTE All nominal levels are at ±10%.

NOTE Specifications are subject to change without notice.

Specifications, Part Numbers, and Accessories, cont'd

Part Numbers

Included parts

These items are included with the TP T Series Transmitter:

Included part	Replacement part number
TP T 15HD A	60-345-02
TP T 15HD AV	60-346-03
TP T BNC DA4	60-349-02
PS 1508 single output external power supply, 15 V, 0.8 A	70-776-01
Captive screw connector, 3-pole, 3.5 mm	10-265-03
<i>TP Transmitters Series Setup Guide</i>	

NOTE *The TP T 15HD AV is a redesigned transmitter. The audio portion of the composite video TP link can be configured to work with the similarly redesigned TP R BNC AV receiver or with older, unmodified receivers. See “[Setting audio jumpers for use with unmodified receivers](#)” in chapter 2, “Installation and Operation”. Redesigned transmitters and receivers have identifying labels.*

Accessories

These items can be ordered from Extron:

Accessory	Part number
PS 150 multiple output 15 V power supply	60-432-01
RSU 129 9.5" Deep 1U Rack Shelf kit	60-190-01
RSB 129 9.5" Deep 1U Basic Rack Shelf in black or gray	60-604-01, -02
RSM 100 TP Rack Mounting Kit	70-123-01
MBU 12 Under Desk Mounting Kit	70-077-01
MBD 129 Through-desk Mounting Kit	70-077-02

Cables and adapters

NOTE *Skew-Free™ A/V UTP cables are not recommended for Ethernet/LAN locations.*

Skew-Free™ A/V cable

Cable	Part number
UTP 23SF-4/3 — 3' (90 cm)	26-569-01
UTP 23SF-4/6 — 6' (1.8 cm)	26-569-02
UTP 23SF-4/12 — 12' (3.6 m)	26-569-03
UTP 23SF-4/25 — 25' (7.6 m)	26-569-04
UTP 23SF-4/35 — 35' (10.6 m)	26-569-05
UTP 23SF-4/50 — 50' (15.2 m)	26-569-06
UTP 23SF-4/75 — 75' (22.8 m)	26-569-07
UTP 23SF-4/100 — 100' (30.4 m)	26-569-08
UTP23SF-4/1000 — 1000' (300 m)	22-141-03
UTP23SF-4P/25 — 25' (7.6 m) plenum	26-570-04
UTP23SF-4P/35 — 35' (10.6 m) plenum	26-570-05
UTP23SF-4P/50 — 50' (15.2 m) plenum	26-570-06
UTP23SF-4P/75 — 75' (22.8 m) plenum	26-570-07
UTP23SF-4P/1000 — 1000' (300 m) plenum	22-142-03

Specifications, Part Numbers, and Accessories, cont'd

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

**USA, Canada, South America,
and Central America:**

Extron Electronics
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

Japan:

Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe, Africa, and the Middle East:

Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:

Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:

Extron Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Middle East:

Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Extron USA - West Headquarters +800.633.9876 Inside USA / Canada Only +1.714.491.1500 +1.714.491.1517 FAX	Extron USA - East +800.633.9876 Inside USA / Canada Only +1.919.863.1794 +1.919.863.1797 FAX	Extron Europe +800.3987.6673 Inside Europe Only +31.33.453.4040 +31.33.453.4050 FAX	Extron Asia +800.7339.8766 Inside Asia Only +65.6383.4400 +65.6383.4664 FAX	Extron Japan +81.3.3511.7655 +81.3.3511.7656 FAX	Extron China +400.883.1568 Inside China Only +86.21.3760.1568 +86.21.3760.1566 FAX	Extron Middle East +971.4.2991800 +971.4.2991880 FAX
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